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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,824	12/16/2003	Hiroaki Takehara	032191	2855

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EXAMINER

RAETZSCH, ALVIN T

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 07/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/735,824	Applicant(s) TAKEHARA ET AL.	
	Examiner Alvin T. Raetzsch	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/9/04; 7/21/04; 2/14/05; 5/19/05</u> | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claim 2** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "...falling within a range of more than 600 to 900..." is not clear. Is the value in the range of 600-900 or is it more than 600?

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. **Claims 1 & 6-7** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 & 6-7 of copending Application No. 10/735844. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claim 1 of the present application does not exclude the collection of some fullerenes in the first filter

step, and the claims of copending application '844 therefore teach the 3 steps of decomposing a hydrocarbon, collecting soot in a first filter, and collecting fullerenes thereafter. Collecting the fullerenes by lowering the process temperature would be obvious to one of skill in the art in order to collect the product while simultaneously cooling to a safe and useful handling temperature.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102 & 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claim 1** is rejected under 35 U.S.C. 102(a) as being anticipated by Yoshikawa et al. article (12/5/03).

Yoshikawa et al. teach fullerenes by combustion followed by filtering the high temperature gas and further lowering the temperature of the filtered gas. The presence of soot in the product implies imperfect combustion.

5. **Claims 1-4** are rejected under 35 U.S.C. 102(e) as being anticipated by Kronholm et al. (2004/0057896).

Kronholm teaches combusting a hydrocarbon to make fullerenes, filtering the soot from the high temperature gas at 400-1000°C (paragraph [0065]), and condensing the fullerenes by lowering the temperature (Fig. 4; [0073-74]). Also taught is using a second filter at 420-470°C (Fig. 3; [0072]), which would remove fullerenes without collecting PAH. The presence of soot in the product implies imperfect combustion.

6. **Claims 5-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronholm et al. (2004/0057896).

Kronholm teaches producing and purifying fullerenes as described above with respect to claims 1-4, but does not state a specific condensing temperature or orientation of the reactor. It is clear that Kronholm is using temperatures low enough to condense fullerenes, which would be known by those of skill in the art to be less than 200°C. It also would have been obvious to one of skill in the art to put the burner at the top of the reactor and the outlet at the bottom. Kronholm speaks in terms of distance from the burner, not vertical orientation. The burner would be placed on top for various reasons, including removal of larger particles with the aid of gravity or because convenience due to location of feed piping and related equipment.

7. **Claim 1** is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Alford et al. (6,887,291).

Alford teaches incomplete combustion of a hydrocarbon to make fullerenes, filtering the soot from the high temperature gas, and condensing the fullerenes by lowering the temperature. The process diagram of Alford (Fig. 2) is nearly identical to that of the applicant's.

8. **Claims 2 & 5-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Alford et al. (6,887,291).

Alford teaches producing and purifying fullerenes as described above with respect to claim 1, but does not teach specific process temperatures or orientation of the reactor. It would have been obvious to one of ordinary skill in the art at the time of the

invention to use the claimed temperatures to filter soot and subsequently condense the vapors, as would be expected keep down the loss of fullerenes in the soot filter and successfully condense volatiles in the heat exchanger. It also would have been obvious to one of skill in the art to put the burner at the top of the reactor and the outlet at the bottom. The burner would be placed on top for various reasons, including removal of larger particles with the aid of gravity or because convenience due to location of feed piping and related equipment.

9. **Claims 6-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronholm et al. (2004/0057896) in view of JP 06-056414.

Kronholm teaches producing and purifying fullerenes as described above with respect to claims 1-4, but does not teach a specific orientation of the reactor. JP '414 produces fullerenes from combustion with a top burner and a bottom outlet. It would have been obvious to one of ordinary skill in the art to put the burner at the top of the reactor and the outlet at the bottom in Kronholm's process, as Kroholm speaks in terms of distance from the burner, not vertical orientation. The burner would be placed on top for various reasons, including removal of larger particles with the aid of gravity or because convenience due to location of feed piping and related equipment.

Any inquiry concerning communications from the examiner should be directed to Alvin T. Raetzsch at 571-272-8164, normally 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Status information for published applications may be obtained from either Private PAIR or Public PAIR, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



ATR

STUART L. HENDRICKSON
PRIMARY EXAMINER